Paper No. 31

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte HENRY GIFFORD

Appeal No. 1998-0631
Application 07/957,990[1]

ON BRIEF

Before SCHAFER, BARRETT, and RUGGIERO, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from an examiner's refusal to allow claims 1-10, 12, 14-47, 97-140, and 206-211. Claims 48-96 and 141-192 have been

[1] Application for patent filed October 8, 1992, entitled "Ergonomic Keyboard."

withdrawn from consideration by Appellant pursuant to a restriction requirement. Claims 11, 13, and 193-205 have been canceled.

We affirm-in-part.

BACKGROUND

The disclosed invention relates to a keyboard that generates signals indicative of key actuation and of the pressure with which the user has pressed the keys. If the pressure exceeds a certain threshold, or a certain average pressure, the key event is annunciated. By warning the user if too much pressure is being employed, injuries such as carpal tunnel syndrome, tendonitis, and repetitive motion syndrome can be avoided.

Claim 1 is reproduced below.

1. A keyboard apparatus comprising:

a keyboard with depressible keys;

means mechanically engaged with the keys and responsive to the pressing of the keys for generating electrical key signals indicative thereof;

output means conveying the key signals externally from the keyboard;

pressure sensing means mechanically engaged with the keys and responsive to pressure upon particular ones of the keys for generating electrical pressure signals

indicative of the pressure on the particular ones of the keys; and

alarm means responsive to the pressure signals being above a predetermined threshold for generating an alarm signal.

The Examiner relies on the admitted prior art (APA) at page 7, lines 2-4, of the specification, and on the following prior art:

Parker 3,612,240 October 12, 1971

Johnson et al. (Johnson) 5,056,057 October 8, 1991

John et al. (John) 1,330,742 September 19, 1973
(United Kingdom patent application)

The Human Factor In Computers, IBM Technical Disclosure Bulletin, Vol. 30, No. 1, June 1987, pp. 478-80 (hereinafter "Human Factor").

Claims 2-8, 17-23, 31-44, 99-112, and 121-134 stand rejected under 35 U.S.C. § 112, second paragraph, as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention because the Examiner and Appellant do not agree on whether the claims read on the species elected in a restriction requirement. See Manual of Patent Examining Procedure (MPEP) § 821 (5th ed., Rev. 14, Nov. 1992).[2]

Claims 1, 9, 10, 12, 14-16, 24-30, 45-47, 97, 98, 113-120, 135-140, and 206-211 stand rejected under 35 U.S.C.

[2] The provisions of MPEP § 821 are substantially identical in the 7th edition, July 1998.

§ 112, second paragraph, as vague and indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention.

Claims 1, 24, 26, 97, 117, and 119 stand rejected under 35 U.S.C. § 102(b) as anticipated by the "Human Factor" publication. The Examiner has apparently withdrawn the rejection of claims 9, 10, 27, 29, 30, 98, 113, 120, 136, 137, and 207 under 35 U.S.C. § 102(b), as set out in the Office Action of Paper No. 20, because the rejection is not repeated in the Examiner's Answer. See Ex parte Emm, 118 USPQ 180, 181 (Bd. App. 1957) (rejection not referred to in the examiner's answer is assumed to have been withdrawn). This renders Appellant's third issue (claims 10, 30, 113, and 137), fourth issue (claims 9, 29, 98, and 136), fifth issue (claim 207), and sixth issue (claims 27 and 120) moot.

Claims 12, 14-16, 25, 45-47, 114-116, 118, 138-140, 206, 210, and 211 stand rejected under 35 U.S.C. § 103 as being unpatentable over the "Human Factor" publication.

Claims 28 and 135 stand rejected under 35 U.S.C. § 103 as being unpatentable over the "Human Factor" publication and Johnson.

Claims 208 and 209 stand rejected under 35 U.S.C. § 103 as being unpatentable over the "Human Factor" publication and the APA, or further in view of either John or Parker.

It appears that the Examiner has withdrawn the rejection of claims 14-16, 26, 27, 45-47, 114-116, 119, 120, and 138-140 under 35 U.S.C. § 112, first paragraph, as failing to provide an enabling disclosure, as set out in the Office Action of Paper No. 20, because the rejection is not repeated in the Examiner's Answer. See Emm, 118 USPQ at 181. This renders Appellant's tenth issue moot.

We refer to the Office Action (Paper No. 20) (pages referred to as "OA__") and the Examiner's Answer (Paper No. 27) (pages referred to as "EA__"), which incorporates by reference the rejection in Paper No. 20, for a statement of the Examiner's position, and refer to the replacement Appeal Brief (Paper No. 26) (pages referred to as "Br__") for a statement of Appellant's arguments thereagainst.

OPINION

Grouping of claims

Claims not separately argued are considered to stand or fall together with broadest claim in the group under

rejection or with the claims from which they depend. See 37 CFR § 1.192(c)(7) (1996) (claims stand or fall together unless appellant includes a statement that the claims do not stand or fall together and, in the argument section, explains why the claims of the group are believed to be separately patentable). Cf. In re Dillon, 919 F.2d 688, 692, 16 USPQ2d 1897, 1900 (Fed. Cir. 1990) (in banc) ("It is not the practice of this court to review claims that an applicant has not separately argued at the Board level, because, inter alia, we lack the benefit of the Board's reasoned decision on the separate patentability of those claims.")

Only argued limitations are addressed

We confine our analysis to issues and differences argued in the briefs. Under USPTO rules, an appellant's brief is required to specify the specific limitations in the rejected claims which are not described in the prior art or rendered obvious over the prior art. See 37 CFR § 1.192(c)(8)(iii) & (iv). Cf. In re Baxter Travenol Labs., 952 F.2d 388, 391, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991) ("It is not the function of this court to examine the claims

in greater detail than argued by an appellant, looking for nonobvious distinctions over the prior art.");

In re Wiechert, 370 F.2d 927, 936, 152 USPQ 247, 254 (CCPA 1967) ("This court has uniformly followed the sound rule that an issue raised below which is not argued in this court, even if it has been properly brought here by a reason of appeal, is regarded as abandoned and will not be considered. It is our function as a court to decide disputed issues, not to create them."); In re Wiseman, 596 F.2d 1019, 1022, 201 USPQ 658, 661 (CCPA 1979) (arguments must first be presented to the Board before they can be argued on appeal).

35 U.S.C. § 112, second paragraph
Claims 2-8, 17-23, 31-44, 99-112, and 121-134

Procedural background

In a Restriction Requirement (Paper No. 5) entered November 9, 1993, the Examiner stated (Paper No. 5, p. 2):

> 1. This application contains claims directed to the following patentably distinct species of the claimed invention:
>
> - Species 1, shown in figure 4.
> - Species 2, figure's [sic] 7-8.
> - Species 3, figure 11.
> - Species 4, figure 12.
> - Species 5, figure's [sic] 13A-13B.
>
> Applicant is required under 35 U.S.C. § 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claim is considered generic.

In a Response (Paper No. 6) entered December 9, 1993, Appellant elected species 1, shown in figure 4, and stated: "Claims that are thought to relate to the figure are claims 1-47 and 97-140."

The Examiner entered a first Office Action (Paper No. 7) on February 1, 1994, holding, without explanation, that claims 2-10, 14-23, 26-47, 98-116 and 119-140 are not readable on the elected species of figure 4 and are withdrawn claims from consideration (Paper No. 7, p. 1).

Appellant filed an Amendment (Paper No. 10) on May 17, 1994, traversing the Examiner's action (Paper No. 10, pp. 17-23).

The Examiner entered an Office Action (Paper No. 11) on August 1, 1994, maintaining that claims 2-10, 14-23, 26-47, 98-116, and 119-140 are not readable on the elected species of figure 4 because the claims "involve elements or teachings not shown in Fig. 4" (Paper No. 11, p. 2) and noting that the claims are withdrawn from consideration.

Appellant filed a second Amendment (Paper No. 12) on November 14, 1994, maintaining the traversal of the Examiner's action (Paper No. 12, pp. 16-17).

The Examiner entered a Final Rejection (Paper No. 15) on June 5, 1995, maintaining that claims 2-10, 14-23, 26-47, 98-116, and 119-140 are not readable on the elected species of figure 4 because the claims "involve elements or teachings not shown in Fig. 4" (Paper No. 15, p. 2) and noting that the claims are withdrawn from consideration.

Appellant filed a Petition under 37 CFR § 1.144 (Paper No. 16) on December 5, 1994, before entry of Paper No. 15, which was lost and resubmitted by facsimile on

June 20, 1995, requesting that claims 2-10, 14-23, 26-47, 98-116, and 119-140 be considered and not withdrawn from consideration.

In a Decision on Petition (Paper No. 17) entered July 11, 1995, the Director of Group 2600 granted Appellant's "Petition under 37 CFR 1.144, filed on December 5, 1994, seeking reversal of the examiner's holding that claims 2-10, 14-23, 26-47, 98-116 and 119-140 are not directed to the elected species and thereby withdrawn from consideration" (Paper No. 17, p. 1). The decision on petition stated that "[u]pon further consideration and per MPEP 821, it is held that claims 2-10, 14-23, 26-47, 98-116 and 119-140 should be considered" (Paper No. 17, p. 2).

The Examiner entered an Office Action (Paper No. 18) on August 3, 1995, acknowledging the petition decision, but notwithstanding the decision, entered a rejection of claims 2-8, 14-23, 26, 27, 31-47, 99-112, 114-116, and 119-140 under 35 U.S.C. § 112, second paragraph, per MPEP § 821 as indefinite as not readable on the elected species of figure 4.

An interview was held between counsel for Appellant and the Group Director (Paper No. 19) on September 7, 1995. The interview summary states: "IT WAS AGREED THAT A CLARIFYING ACTION WOULD BE PREPARED EXPLAINING THE ACTIONS TAKEN WITH REGARD TO ALL CLAIMS, INCLUDING CLAIMS AT DISPUTE AS READABLE ON THE ELECTED INVENTION."

The Examiner entered a non-final Office Action (Paper No. 20) on October 13, 1995, vacating the Office Action of August 3, 1995 (Paper No. 18) and again rejecting claims 2-8, 17-23, 31-44, 99-112, and 121-134 under 35 U.S.C. § 112, second paragraph, per MPEP § 821 as indefinite as not readable on the elected species of figure 4.

Appellant sent a Letter (Paper No. 21) on November 21, 1995, to the Group Director stating that the action (Paper No. 20) of October 13, 1995, did not provide substantive examination in accordance with the petition decision (Paper No. 17).

In a Response Letter (Paper No. 22) entered December 14, 1995, the Group Director noted that substantive examination had taken place of approximately 19 more claims

than previously considered and that the procedure followed by the Examiner is correct. The letter states that claims reciting features not shown in figure 4 "are not readable on the elected species" (Paper No. 22), p. 1), although it is not clear whether this is merely a summary of the Examiner's position or is the Group Director's opinion. The letter concludes that "the actions by the examiner are considered proper" (Paper No. 22, p. 2).

Appellant filed a Notice of Appeal (Paper No. 23) on April 18, 1996.

First issue[3] - claims 2-8, 17-23, 31-44, 99-112, 121-134

The Board's jurisdiction is limited to those matters involving the rejection of claims. In particular, the Board does not have jurisdiction to review an examiner's requirement for restriction. See In re Hengehold, 440 F.2d 1395, 1404, 169 USPQ 473, 480 (CCPA 1971). However, according to the procedure set forth in MPEP § 821,

[3] We organize the decision according to Appellant's ordinal numbering of the issues. As previously noted, the third, fourth, fifth, sixth, and tenth issues are moot because the Examiner has withdrawn the rejections as to these claims made in Paper No. 20.

when an applicant and the examiner disagree on whether or not claims are directed to the elected subject matter, claims held to be drawn to non-elected inventions, including claims to non-elected species, are directed to be rejected under 35 U.S.C. § 112, second paragraph: "Because applicant believes the claims are readable on the elected invention and the examiner disagrees, the metes and bounds of the claim(s) cannot be readily ascertained, rendering the claim(s) vague and indefinite within the meaning of 35 U.S.C. 112, second paragraph." This holding, if traversed, is said to be appealable. Id.

"The legal standard for definiteness is whether a claim reasonably apprises those of skill in the art of its scope." In re Warmerdam, 33 F.3d 1354, 1361, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994). In our opinion, the MPEP procedure is improper because the claims do not become vague and indefinite per se to the hypothetical person of ordinary skill in the art just because the examiner and applicant do not agree on whether the claims are drawn to an elected species. It is quite possible for the claims to be definite and yet not read on an elected species. The Examiner has

not shown that the scope of the disputed claims is unclear. The fact that subject matter in the claims is not shown in figure 4 does not make the claims vague and indefinite. The proper procedure for review of a restriction requirement is a petition under 37 CFR § 1.144. Here, Appellant did properly petition under 37 CFR § 1.144 for reversal of the Examiner's withdrawal of claims as not corresponding to the elected species, which petition was granted. At this point, the Examiner was required to examine the claims on the merits. However, the Examiner's subsequent rejection of certain claims under 35 U.S.C. § 112, second paragraph, was held to be proper procedure by the same Group Director. Accordingly, if Appellant is to get any meaningful review of the Examiner's action it must be by us.

We limit our review to whether the rejected claims correspond to the elected species represented by figure 4, and, although we comment on the restriction requirement, we do not decide whether the restriction requirement was proper. The statement in the Response Letter (Paper No. 22) that claims reciting features not shown in figure 4 "are not readable on the elected species" (Paper No. 22), p. 1), does

not clearly represent a holding by the Group Director and, in any case, is inconsistent with the Petition Decision (Paper No. 17); thus, the Response Letter is not binding on our decision.

The problem with the restriction requirement is that the Examiner never identifies the structural features that are characteristic of the allegedly patentably distinct species. Thus, we start by analyzing the figures. Figure 4 (species 1) is directed to a special purpose keyboard 20' having an internal pressure monitoring system. Figure 5 describes the internal configuration of keyboard 20' and must be considered part of species 1. Figures 4 and 5 are described in the specification at page 6, line 25, to page 9, line 19. Figures 7 and 8 (species 2) are directed to a conventional prior art keyboard 20 which sits in a keyboard adaptor 90 (specification, p. 10, line 22, to p. 11, line 14). Figure 11 (species 3) and figure 12 (species 4) show two hardware approaches for monitoring the pressure signal with an external monitor if the optional pressure data line 93 (of figures 5 and 8) is employed (specification, p. 13, lines 1-25); figure 11 shows a single

keyboard and figure 12 shows plural keyboards. It does not seem reasonable to us to consider the single keyboard monitor of figure 11 to be a patentably distinct species from the plural keyboard monitor of figure 12. Moreover, the monitoring apparatus of figures 11 and 12 could be used with either the special purpose keyboard 20' of figures 4 and 5 or the conventional keyboard 20 and keyboard adaptor 90 arrangement of figures 7 and 8 and, so, species 3 and 4 are not mutually exclusive species from species 1 and 2. Finally, figures 13A and 13B (species 5) disclose a wrist monitor which can (but does not have to) be used with one of the pressure monitoring keyboards of figures 4 or 7 (specification, p. 15, line 8, to p. 16, line 10) and can be used with the monitoring schemes of figures 11 and 12. Thus, figures 13A and 13B represent either a separate invention or an improvement on the pressure monitoring embodiments of figures 4 and 7. Depending on how the embodiment of figure 13 is claimed, it may or may not be properly restrictable.

Assuming the restriction requirement was proper, we agree with Appellant's argument (Br12-13) that the election

of figure 4 (and figure 5) identifies a keyboard with internal pressure monitoring and processing capabilities.

The Examiner holds that claims 2-8, 17-23, 31-44, 99-112, and 121-134 do not read on the elected species because (OA3):

> [T]hese claims are all directed to averaging signals over pre-defined subsets of keys. In contrast therewith, the description of the Fig. 4 embodiment at p. 6, line 25 to p. 7, line 5 teaches only that key-generated signals from all parts of the keyboard may be combined to form a single parameter, i.e. there are no predefined "subsets" of keys associated with the Fig. 4 embodiment. Thus, it appears that the Fig. 4 embodiment is unable to do any sort of "region averaging" or "shared characteristic" evaluation.

The Examiner appreciates that a determination of whether claims are readable on an elected species is based on all parts of the disclosure which are directed to the elected species, but finds no description linking the rejected claims to figure 4 (OA4).

Appellant responds: (1) the pressure transducers of figure 4 are capable of performing any type of averaging (i.e., any key, regions of keys, or types of keys) (Br13-14); (2) there is no other species to which the subject matter of the "rejected" claims can belong, thus denying Appellant the opportunity to have the claims

considered at all (Br14);(3) the rejection directly contradicts MPEP § 806.04(f) because claims 1 and 2 cannot be mutually exclusive (Br16-17).

We agree with Appellant's arguments. In addition, what is persuasive is that the specification at page 13, line 26, to page 15, line 7, clearly indicates that an alternative to the annunciation of any single keystroke being made at a level higher than a predetermined threshold is to "define distinct physical regions of the keyboard, and compile key pressure information with respect to the regions" (specification, p. 13, line 30 to p. 14, line 1) or "to compile pressure information with respect to characteristics of the characters being typed" (specification, p. 14, lines 13-15). Although not relied on in the brief, this description was mentioned by Appellant earlier in the prosecution because the Examiner stated that "this portion of the specification [pages 13-14] relates to Figs. 11-12 (species 3 and 4, respectively), not Fig. 4" (OA4). The Examiner clearly errs in finding these statements at pages 13-14 of the specification to be limited to figures 11 and 12. This description applies to processing of the

pressure information no matter which keyboard embodiment is involved and, so, applies to all keyboard embodiment species (i.e., at least species 1-4). It is true that figure 4 does not show the processing described at pages 13-14, but neither do any of the other figures; the figures show the pressure measurement structure, not the processing. Therefore, the specification as a whole indicates that the region averaging and shared characteristic evaluation applies to all keyboard species, including the elected species of figure 4.

The Examiner's finding "that the Fig. 4 embodiment is unable to do any sort of 'region averaging' or 'shared characteristic' evaluation" (OA3) is erroneous to the extent that it finds the structure of figure 4 cannot be used in connection with software processing to perform the functions. As noted, none of the apparatus figures shows the processing, but the processing could be performed in the microprocessor 43' of figure 5 of species 1. A program is clearly capable of classifying the depressed keys (identified by their scancodes) into "regions" or "characteristics" and matching it with the pressure

information (whether from a single strain gauge, two to four pressure transducers, or a sensor for each key, specification, pp. 6-7) from when the key was depressed. For example, if the scancode indicates the "J" key was pressed, the program could associate the corresponding pressure signal with a region associated with the right index finger because the "J" key is the home key for right hand and is usually struck with the right index finger.

For the reasons stated above, we conclude that claims 2-8, 17-23, 31-44, 99-112, and 121-134 are directed to the elected species of figures 4 and 5. The rejection of claims 2-8, 17-23, 31-44, 99-112, and 121-134 is reversed. Because we sustain the rejection of the claims upon which these claims depend, as discussed infra, the Examiner must reopen prosecution to examine these claims on the merits.

35 U.S.C. § 102(b)
Claims 1, 24, 26, 97, 117, and 119

Second issue - claims 1 and 24

Appellant argues that the "Human Factor" disclosure of a useability exception signal which can be used by an application program to provide more or less prompting, is

not an "alarm means . . . for generating an alarm signal," as recited in claim 1. In connection with claim 24, Appellant states that the annunciator apparatus is an audiovisual alarm device, that it is disclosed that "[t]he annunciation could be a sound or a light" (specification, p. 8, line 5), and that "in order to provide an alarm, the computer 17 of the ['Human Factor'] publication would have to be modified, i.e., reconfigured to allow message means 15 or memories 41, 43 to become an audio or light alarm means to warn the user" (Br18).

The Examiner relies (EA8) on his previous arguments in Paper No. 20, paragraph 13. The Examiner concludes that "alarm" is capable of a broad interpretation to mean an "alert" or "warning," and that sound and light are only examples of different kinds of alarms (OA14). The Examiner finds "the 'prompting' or 'questioning' provided to a user in the 'Human Factor' publication is considered to fall within the realm of the claimed 'alarm means', since the point of the 'prompting' or 'questioning' is to alert or warn the keyboard user" (OA14).

We agree with the Examiner. Claim 1 recites an "alarm means . . . for generating an alarm signal" and claim 24 recites "message means audiovisually perceptible to a user . . . [and] means . . . for generating a message at the message means." Neither of these limitations require sound or light. The term "audiovisually perceptible" in claim 24 is broad enough to read on a message displayed on a screen, such as provided in the "Human Factor" publication, that is visually perceptible. Since dependent claim 12 further recites "sound generation means . . . for generating sound audible to a user," such sound limitation is not part of claim 1. We agree with the Examiner that the "prompting" and "questioning" disclosed by the "Human Factor" document are forms of an "alarm signal," as broadly claimed, and are "a message at the message means," as broadly recited in claim 24. Thus, we sustain the anticipation rejection of claims 1 and 24.

Not argued - claims 26, 97, 117, 119

We do not find any separate arguments regarding claims 26, 97, 117, and 119. Thus, claims 26, 97, 117, and 119 fall together with claims 1 and 24, with which they are

grouped. The rejection of claims 26, 97, 117, and 119 is sustained.

35 U.S.C. § 103
Claims 12, 14-16, 25, 45-47, 114-116, 118, 138-140, 206, 210, and 211

Seventh issue - claim 206

The Examiner states (OA12):

> [W]here the "Human Factor" publication teaches using pressure transducers with selected ones of the keys, the transducers thus "collect data" from selected points on the keyboard; one skilled in the art would have appreciated that such "selected points" may be varied as to (i) the desired number of points, and (ii) the desired physical arrangement of the points on the keyboard, to achieve the desired result. Therefore, it would have been obvious to choose as the "selected points" in the "Human Factor" publication the four "corners" of the keyboard, i.e. under keys closest to the corresponding corners.

Appellant argues that had the claims been twice rejected, Appellant could have had the opportunity to ask, in view of In re Ahlert, 424 F.2d 1088, 165 USPQ 418 (CCPA 1970), for a statement by the Examiner of the basis the reasoning (Br21). Appellant argues that since the claim is on appeal, it can only be argued that the obviousness rejection must fail due to absence of any statement of the

basis for the views expressed in providing the elements that are missing in the "Human Factor" reference (Br21).

Ahlert stands for the proposition that "[a]ssertions of technical facts in areas of esoteric technology must always be supported by citation to some reference work recognized as standard in the pertinent art," 424 F.2d at 1091, 165 USPQ at 420 (CCPA 1970). Accord In re Pardo, 684 F.2d 912, 917, 214 USPQ 673, 677 (CCPA 1982). Ahlert is usually cited in connection with the Examiner taking Official Notice of a fact, which is not directly on point here. In this case, the Examiner is relying on what would have been apparent to one having ordinary skill in the art looking at the "Human Factor" publication. The Examiner impliedly interprets "collecting data from the four corners of the keyboard" to mean that the data can come from keys at the corners of the keyboard. Although this literal interpretation does not appear to be what was intended, claim 206 does not specifically state how data is collected from the four corners of the keyboard, e.g., that there are pressure sensors on the underneath of a circuit board supporting the keys; thus, the Examiner's interpretation is not

unreasonable. We agree with the Examiner's reasoning that one of ordinary skill in the art would have had sufficient skill to recognize that the keys in "Human Factor" could be any keys, including keys at the corners of the keyboard. In addition, however, the "Human Factor" publication states that "[t]he biofeedback inputs can be any of a number of known input devices including . . . force transducers under the keyboard to measure key depression force and other equivalent devices" (p. 478). Thus, the "Human Factor" publication indicates that the pressure sensors can be under the keyboard. In our opinion, it would have been within the level of skill of one of ordinary skill in the art to locate the pressure sensors under the keyboard at the four corners for reasons of stability. For these reasons, we sustain the rejection of claim 206.

We recommend the Examiner apply the article by Rempel et al. (Rempel), Fingertip Forces While Using Three Different Keyboards, Proc. of the Human Factors Soc'y, 35th Annual Meeting, 1991, pp. 253-255, in combination in any future prosecution. Rempel discloses measuring vertical

forces applied to a keyboard by a strain gauge load cell attached to each side of the keyboard (p. 253, left col.).

Eighth issue - claims 14-16, 45-47, 114-116, and 138-140

The Examiner concludes (OA11-12):

> [W]here the general conditions of the claims are disclosed in the prior art (i.e., monitoring excessive force by a user in striking the keys of a keyboard), it is not inventive to discover the optimum or workable ranges by routine experimentation (see In re Aller, [220 F.2d 454,] 105 USPQ 233 (CCPA 1955)); as such, given the "general conditions" disclosed by the "Human Factor" publication, it would have been obvious to one of ordinary skill in the art to select a particular value of "three minutes" for the predetermined interval and a particular range of values of "180 to 300 grams" for the predetermined threshold.

Appellant argues that had the claims been twice rejected, Appellant could have had the opportunity to ask, in view of Ahlert, for a statement by the Examiner of the basis the reasoning (Br22). Appellant argues that since the claims are on appeal, it can only be argued that the obviousness rejection must fail due to absence of any statement of the basis for the views expressed in providing the elements that are missing in the "Human Factor" reference (Br22). It is argued (Br22): "Nothing in the reference offers any numerical values at all, nothing in the reference suggests or even hints at how one would even know what value is 'optimum', let alone 'workable.'"

There is a predetermined threshold 37 in the "Human Factor" publication. However, the "Human Factor" apparatus works by comparing the incremental change between the current key force and the last key force to a threshold or the change from the average value to a threshold, rather than comparing each key force against an absolute threshold. The Examiner fails to address this difference in the obviousness reasoning. Nevertheless, we consider that it would have been trivially obvious to one of ordinary skill in the art to compare the current key force directly against a threshold instead of comparing the key force to the last key force or to the average key force in order to simplify the measurement. Although no numerical threshold values are taught in the "Human Factor" publication, one of ordinary skill in the art, knowing that a threshold value should be selected, is presumed to have had sufficient skill to determine a specific value by routine experimentation. See In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980) ("[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art."); In re Aller, 220 F.2d 454, 456,

105 USPQ 233, 235 (CCPA 1955) ("[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."). Appellant has not shown that the claimed values and ranges are unexpected or would not have been determined by routine experimentation. For the reasons stated above, the rejection of claims 14-16, 45-47, 114-116, and 138-140 is sustained.

We recommend that the Examiner apply the Rempel article, Fingertip Forces While Using Three Different Keyboards, in combination in any future prosecution. Rempel discloses that the forces on a keyboard can cause chronic musculoskeletal disorders and measures key forces squarely within the claimed range, which suggests the claimed range of threshold values. Note that Rempel also discloses measuring the forces on index, middle, ring, and pinkie fingers of the left and right hands (p. 254); thus, Rempel discloses measuring pressure signals for regions (e.g., claim 3).

Not argued - claims 12, 25, 118, 210, and 211

We do not find any arguments regarding claims 12, 25, 118, 210, and 211. Accordingly, these claims stand or fall together with the claims on which depend. The rejection of claims 12, 25, 118, 210, and 211 is sustained.

35 U.S.C. § 103
Not argued - Claims 28 and 135

We do not find any arguments regarding claims 28 and 135. Accordingly, these claims stand or fall together with the claims on which depend. The rejection of claims 28 and 135 is sustained.

35 U.S.C. § 103
Claims 208 and 209

Ninth issue - claims 208 and 209

Appellant argues that it is inconsistent for the Examiner to rely on the statement in the specification that those skilled in the art knew how to use levers to collect pressure information as a reason why claim 208 is rendered unpatentable over "Human Factor" and, yet, at the same time maintain a rejection under 35 U.S.C. § 112, second paragraph (Br23):

> It is respectfully submitted that the Examiner can't have it both ways -- either it is true that those skilled in the art know [sic, knew] how levers work in measuring pressure (in which case the paragraph-6 [sic, 8?] rejection [in Paper No. 20] of claims 206 and 208 should be withdrawn) or they don't (in which case claim 208 should not be rendered unpatentable by the "Human Factors" publication, which lacks teaching of such levers). The former is the case, consistent with applicant's statement in the specification (page 7, lines 2-3). . . . [Claims 208 and 209] should be allowed for the same reasons as stated above for claim 206.

The Examiner states that the § 112, first paragraph, rejection says nothing about lever arms and, so, has nothing to do with the § 103 rejection (EA10).

We assume that Appellant's reference to paragraph 6 of Paper No. 20 was intended to refer to the § 112, second

paragraph, rejection in paragraph 8, since paragraph 6 has nothing to do with claims 208 and 209.

We find nothing inherently wrong with inconsistent grounds of rejection. Sometimes a claim may be considered indefinite and yet the examiner does his or her best job to address the patentability issues based on an assumed meaning. This saves time for both the examiner and the applicant. The real issue is the propriety of the obviousness rejection.

Appellant provides no argument why claim 208 would not have been obvious for the reasons stated by the Examiner. The argument that the claims should be allowed for the same reasons stated for claim 206, depends on claim 206 for patentability. Because Appellant has not pointed to any error in the rejection, the rejection of claims 208 and 209 is sustained.

35 U.S.C. § 112, second paragraph
Claims 1, 9, 10, 12, 14-16, 24-30, 45-47, 97, 98, 113-120, 135-140, and 206-211

Eleventh issue - claims 1, 24, 97, 117, and 206

The Examiner states (OA6):

> In claims 1, 24, 97, 117 and 206, it is unclear if the pressure sensing means being "responsive to pressure upon particular ones of the keys ..." implies that there are other keys besides the "particular ones" to which the pressure sensing means isn't responsive; in other words, it is unclear if the pressure sensing means is intended to distinguish between one "subset" of the keys on a keyboard (i.e., the "particular ones" of the keys) to which it is responsive, and other "subsets" of the keys on the keyboard (i.e., one or more subsets NOT including the "particular ones") to which it isn't responsive.

Appellant argues that the claims were amended at the Examiner's request and the reference to "particular ones" merely means that the two "pressings" in the claims correspond to each other (Br25-26).

Appellant does not answer the Examiner's reasoning. Nevertheless, we reverse the rejection. The "particular ones of the keys" in claim 1 could be all, or a subset of all the keys of the keyboard. This is a broad limitation, not an indefinite one. Claim breadth should not be confused with indefiniteness. See In re Miller, 441 F.2d 689, 693, 169 USPQ 597, 600 (CCPA 1971). The rejection of claims 1, 24, 97, 117, and 206 is reversed.

Twelfth issue - claim 28

The Examiner states (OA6):

> In claim 28, it is unclear if the "means receiving key signals" (lines 2-3) is the same element as the "input means ... for receiving the key signals" recited in claim 24, lines 20-21.

Appellant responds that it is clear the two means are not the same because the "input means" of claim 24 is an element distinct from the processor because the "input means" and processor are "operatively coupled," whereas the "means receiving key signals" of claim 28 is one of the elements of the processor (Br26).

The Examiner responds that the claim is still confusing because the processor uses both elements to perform the same function and it is unclear how the means cooperate to provide key signals to the processor (EA11-12).

Although the language could be more precise, it does not rise to the level of being indefinite. The functions are not the same. The "input means operatively coupled to the processor" (claim 24) is evidently the wire that conveys the interleaved key signals and pressure signals to the processor, whereas the "means receiving key signals" (claim 28) only receives key signals (scancodes) after they have been distinguished from the pressure signals in the processor. Accordingly, there are not two input means to

the processor as the Examiner assumes. The rejection of claim 28 is reversed.

Thirteenth issue - claim 135

The Examiner states (OA6-7):

> In claim 135, line 2, "further" should be deleted since the processor has not been previously defined (in claim 117) as "comprising" anything.
>
> It is unclear what relationship, if any, exists between the "key signals" referred to on line 2 of claim 135 and the "key signals" recited in claim 117; in particular, it is unclear if these are the same or different key signals. Consequently, it is unclear which recitation of "key signals" is relied upon for antecedent basis of "the key signals" at claim 135, lines 6 and 8.
>
> In claim 135, lines 4-5, "loading into the memory a terminate-and-stay-resident routine in the memory" is vaguely worded, i.e. "in the memory" implies that the TSR routine is already in the memory.
>
> In claim 135, it is unclear what element carries out the "distinguishing" step on lines 6-7, i.e. does this step merely reflect the generation of distinct "key" and "pressure" signals recited on lines 4-11 of claim 117, or some operation carried out by the processor.

Appellant volunteers to delete "further," to insert the word "the" before the word "key" to clarify the antecedent basis, and delete "in the memory." Appellant notes that these formal rejections were raised for the first time in

the fourth Office Action (Paper No. 20). Because we think the minor language problems are somewhat indefinite and because Appellant volunteers to fix them, we sustain the rejection of claim 135. Since the Examiner must still examine the claims which were improperly rejected as not reading on the elected species, Appellant will have adequate opportunity to amend the claim. Thus, for all the cases where Appellant volunteers to fix problems in the claims, it is not necessary to direct the Examiner to accept the changes as requested by Appellant.

As to the "distinguishing" step, Appellant notes that there is no requirement to state what element carries out each step, but that the step is disclosed to be performed by the terminate-and-stay-resident (TSR) routine in the specification (p. 23, lines 4-6) (Br27). The Examiner does not respond.

We agree with Appellant's argument that it is unnecessary to state what element performs the step in a method claim. The element that performs the step is disclosed to be the TSR routine, so there is no enablement

question. This basis for the rejection of claim 135 is reversed.

Fourteenth issue - claims 136 and 137

The Examiner states (OA7):

> It is unclear what relationship, if any, exists between the "pressure signals" recited in claims 136-137 and the "pressure signals" recited in claim 117; in particular, it is unclear if these are the same or different pressure signals.

Appellant volunteers to insert the word "the" before the phrase "pressure signals" to clarify the antecedent basis and notes that this formal rejection was raised for the first time in the fourth Office Action (Paper No. 20) (Br27-28). Because we think the minor language problem is somewhat indefinite and because Appellant volunteers to fix it, we sustain the rejection of claims 136 and 137.

Fifteenth issue - claim 207

The Examiner states (OA7):

> In claim 207, line 3, "capable of detecting pressure..." is indefinite as it is unclear if the pressure transducers in fact detect pressure in the manner recited; in general, merely reciting that an element is capable of performing a function says nothing about whether the element actually performs the function.

Appellant volunteers to delete the offending phrase (Br28). However, in this case, we do not see a problem with the claim language. The pressure transducers must be "capable of detecting pressure," regardless of whether they ever do or not. "Capable of detecting pressure" specifies a property of the pressure transducer and is not indefinite. Claim 207 is an apparatus claim and it does not require actual operation of the apparatus. The rejection of claim 207 is reversed.

Sixteenth issue - claims 118 and 211

The Examiner states (OA7):

> In claims 118 and 211, each occurrence of "further" should be deleted, since (i) there is no prior recitation of the message means "comprising" anything, and (ii) it otherwise appears that "generating a sound from the annunciator" (claim 118, line 4) or "generating a light" (claim 211, line 3) occurs additional to "generating a message at the message means" (claim 117, next-to-last line), which does not appear to be intended.

Appellant volunteers to delete the offending word (Br28). Because we think the minor language problem is somewhat indefinite and because Appellant volunteers to fix it, we sustain the rejection of claims 118 and 211.

Seventeenth issue - claim 206

The Examiner states (OA7):

> In claim 206, lines 9-10, "collecting data from the four corners of the keyboard" is unclear as to whether it is intended that (i) the pressure sensing means are in some undefined location and collect data from some undefined means that are in the corners, (ii) the pressure sensing means are in some undefined location and collect data from the "corners" per se, which is not understood, or (iii) the pressure sensing means are themselves located in the "corners" and collect data from some unidentified source. If situation (iii) is true, then it is unclear if the "data" has anything to do with the "pressure signals" on line 12.

Appellant responds that the meaning is clear from the description in the specification at page 6, line 30 to page 7, line 5 (Br29).

The Examiner responds that the specification is just as unclear as claim 206 because it is vague as to what element generates the "data" that the pressure sensing means "collect" (EA12).

We agree with Appellant that the "pressure sensing means for collecting data from the four corners of the keyboard" is clear, especially in light of the specification, which must be looked to for this means-plus-

function limitation.[4] The force from the four corners of the keyboard is collected either by a pressure sensor (e.g., strain gauge) located at each corner or by lever arms from the corners to a pressure sensor(s) located elsewhere (the claim does not have to define where). Therefore, we reverse the rejection of claim 206.

Eighteenth issue - claim 208

The Examiner states (OA8):

> Likewise, in claim 208 it is unclear if the "pressure data" on line 3 has anything to do with the "pressure signals" on line 12 of claim 206. Further, where both the "lever arms" and the "keys" are strictly mechanical elements, it is unclear what is meant by one mechanical element collecting "data" from another mechanical element.
>
> In claim 208, lines 4-5, it is unclear if a given key needs to be depressed before the lever arms can collect "data" from that key, i.e. "collecting pressure data from all the keys upon key depression" implies that each key provides "data" even if some other key was depressed.

As to the "pressure data" versus "pressure signals," Appellant states that the specification, page 7, lines 1-5, removes any lack of clarity and that "pressure data" are

[4] Claim 206 may be clearer if the comma in the phrase "keyboard, mechanically" is deleted.

mechanically communicated data, while "pressure signals" are electrical signals (Br29-30).

The Examiner maintains that the claim is unclear because "data" in this art generally refers to some type of electronic signal (EA13).

We agree with Appellant that the claim language is clear to one of ordinary skill in the art, who would have been able to distinguish between mechanically transmitted data ("pressure data") and electrical signals ("pressure signals"). We disagree with the Examiner's interpretation of "data" as requiring an electrical signal. This basis for the rejection of claim 208 is reversed.

As to the statement that it is indefinite how one mechanical element can collect data from another mechanical element, Appellant points to the specification, page 7, lines 1-5, and notes that one mechanical element collects pressure data from another mechanical element when one element presses on the other (Br30).

The Examiner does not respond to this argument. Appellant's argument is rational and persuasive. This basis for the rejection of claim 208 is reversed.

Finally, as to the statement that it unclear if a given key needs to be depressed before the lever arms can collect data, Appellant notes that this is exactly like asking if it is necessary to step onto a scale before its lever arms collect data from one's weight on the scale (Br3).

The Examiner maintains that it is unclear if the keys collect data from all keys during each depression of a key or only collect data from the depressed key(s) themselves and that the example of stepping on a scale is not understood (EA13).

While Appellant does not respond on point to the Examiner's reasoning, we nevertheless are not persuaded by the Examiner's rejection. The limitation of "collecting pressure data from all the keys upon key depression" is broad, not indefinite. In any case, it is possible to collect data from keys which are not depressed; the data is just zero. This basis for the rejection of claim 208 is reversed.

In summary, the rejection of claim 208 is reversed.

Nineteenth issue - claim 209

The Examiner states (OA8):

> In claim 209, it is unclear if the "pressure transducers" (i) include, (ii) are additional to, or (iii) replace, the "pressure transducer" of claim 208.

Appellant notes that claim 209 contains a typographical error and should depend from claim 206 and volunteers to correct the error (Br31). Because the typographical error creates an indefiniteness problem and because Appellant volunteers to fix it, we sustain the rejection of claim 209.

CONCLUSION

The rejection of claims 2-8, 17-23, 31-44, 99-112, and 121-134 under 35 U.S.C. § 112, second paragraph, as vague and indefinite as not reading on the elected species is reversed.

The rejection of claims 1, 24, 28, 97, 117, and 206-208 under 35 U.S.C. § 112, second paragraph, as vague and indefinite is reversed, while the rejection of claims 118, 135, 136, 137, 209, and 211 under § 112, second paragraph, is sustained.

The rejection of claims 1, 24, 26, 97, 117, and 119 under 35 U.S.C. § 102(b) is sustained.

The rejections of claims 12, 14-16, 25, 28, 45-47, 114-116, 118, 135, 138-140, 206, and 208-211 under 35 U.S.C. § 103 are sustained.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

LEE E. BARRETT	)	
Administrative Patent Judge	)	
	)	BOARD OF PATENT
	)	APPEALS
	)	AND
	)	INTERFERENCES
JOSEPH F. RUGGIERO	)	
Administrative Patent Judge	)	

SCHAFER, Administrative Patent Judge, concurring

I fully concur with my colleagues' opinion. However, I write separately about the examiner's rejection of claims 2-8, 17-23, 31-44, 99-112 and 121-134 under 35 U.S.C. § 112, ¶ 2 and the application of MPEP § 821. I would reverse the rejection on the basis that the examiner has not made out a prima facie case of indefiniteness and, thus, has not met the applicable burden of proof necessary to maintain a rejection under 35 U.S.C. § 112, ¶ 2. In my view, it is unnecessary and inappropriate to review whether the rejected claims read on the elected species since 1) that decision relates directly to the correctness of the restriction requirement and is petitionable rather than appealable, and 2) the examiner's holding that claims 2-8, 17-23, 31-44, 99-112 and 121-134 read on the elected species was overturned in a petition to the examiner's Group Director.

In rejecting the claims, the examiner cites and relies upon on MPEP § 821. In pertinent part, this section provides:

> Because applicant believes the claims are readable on the elected invention and the examiner disagrees, the metes and bounds of the claim(s) cannot be readily ascertained,

> rendering the claim(s) vague and indefinite within the meaning of 35 U.S.C. 112, second paragraph.

In my view this procedure is improper. A decision on whether a claim is "vague and indefinite" under § 112, ¶ 2, requires a determination of whether those skilled in the art would understand what is claimed when the claim is read in light of the specification. Orthokinetics Inc. v. Safety Travel Chairs, Inc., 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986); Seattle Box Co. v. Industrial Crating & Packing Inc., 731 F.2d 818, 826, 221 USPQ 568, 574 (Fed. Cir. 1984); In re Morasi, 710 F.2d 799, 803, 218 USPQ 289, 292 (Fed. Cir. 1983). As with all rejections, the burden of proof in rejecting claims rests with the examiner. In re Oeticker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Thus, the examiner has the burden of showing that the hypothetical person of ordinary skill in the art would not understand the scope of the claimed subject matter. MPEP § 821 appears to side step this burden by creating a per se rule of indefiniteness whenever the examiner and applicant disagree as to whether claims are readable on the elected species. The fact that the examiner

and the applicant, neither of whom are persons of ordinary skill in the art, disagree does not address the fundamental question of why the hypothetical person of ordinary skill in the art would not understand the scope of the claims when the claims are read in light of the specification. While, the disagreement may indicate a possible problem, the disagreement standing alone is insufficient to satisfy the examiner's burden. To satisfy the burden the examiner must identify the specific claim language which renders the claims indefinite and point to evidence in the record or provide an explanation as to why one skilled in the art would not understand the scope of the claims. Since the examiner has failed to meet this burden I would reverse on this basis alone, and it is unnecessary "to review whether the rejected claims correspond to the elected species represented by figure 4 . . . ." Such analysis, under the facts of this case, has not been shown to be relevant to the indefiniteness issue.

	)	BOARD OF PATENT
	)	APPEALS
RICHARD E. SCHAFER	)	AND
Administrative Patent Judge	)	INTERFERENCES

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